



Dart Aerospace Ltd.  
1270 Aberdeen St  
Hawkesbury, ON  
K6A 1K7  
Canada

Tel (613) 632-5208  
Fax 613 632-5246

S150637

**MISC**  
**Job Sheet 189988**



**Part No:** MISC

**Job Qty:** 4 ea

**Part Name:** MISCELLANEOUS



**Part Weight:** 0 lbs

**Status:** New

**Priority:** Medium

**Job Created:** 2/1/19

**Job Tracking No:** TP-D139-10198-2RevC

**Due Date:** 2/7/19

**Created By:** Linda Lacelle

**Type:** R+D

**Description:**

**Ship Via:**

### Bill of Materials

### Job Routing

| Op No | Operation                 | Qty   | Start Date | Due Date | Standard  |         | Workcenter / Supplier Lead Time | Sign-off    |
|-------|---------------------------|-------|------------|----------|-----------|---------|---------------------------------|-------------|
|       |                           |       |            |          | Setup Hrs | Run Hrs |                                 |             |
| 5     | Purchasing                | 4 pcs | 2/7/19     | 2/7/19   | 0.00      | 0.00    |                                 | P0039083    |
| 15    | Packaging                 | 4 pcs | 2/7/19     | 2/7/19   | 0.00      | 0.00    | Packaging2                      | 17-02-04    |
| 17    | QUALITY - DOCUMENT REVIEW | 4 pcs | 2/7/19     | 2/7/19   | 0.00      | 0.00    |                                 | 19-02-04    |
| 100   | QC21-FG                   | 4 Ea  | 2/7/19     | 2/7/19   | 0.00      | 0.00    | QC21                            | FEB 05 2019 |

### Job BOM

| Part / Item | Component Name | Quantity     | Operation    | Container |
|-------------|----------------|--------------|--------------|-----------|
| MISC        | MISCELLANEOUS  | 4 pcs (1 ea) | 5-Purchasing | S150634   |

### Job Allocations

| Operation    | Component Part | Required | Inventory | Allocated |
|--------------|----------------|----------|-----------|-----------|
| 5-Purchasing | MISC           | 4        | 3         | 0         |

### Part Specifications

Specifications could not be found.

## Linda Lacelle

---

**From:** Marcel Daviau  
**Sent:** Thursday, January 31, 2019 4:28 PM  
**To:** Linda Lacelle; Patrick Duval  
**Subject:** FW: Burn test per TP-D139-1019-2  
**Attachments:** TP-D139-1019-2RevC.pdf

189963

As discussed also need to create a job number to ensure traceability to the PO and the test coupons

Thanks

Marcel

---

**From:** Chris Provencal <cprovencal@dartaero.com>  
**Sent:** Thursday, January 31, 2019 9:18 AM  
**To:** Steven Hemmerich <shemmerich@dartaero.com>; Marcel Daviau <mdaviau@dartaero.com>  
**Cc:** Victoria Seib <vseib@dartaero.com>; David Shepherd <dshepherd@dartaero.com>  
**Subject:** Burn test per TP-D139-1019-2

The burn test samples are on my desk. The actions based on our last conversation:

- 1) Create no charge PO for Llamas Plastics Inc. for: Qty(4) 4"x14" coupons of Clear Tuffak GP 0.177" thick cut to <0.125" thick and coated both sides with LPI Aerocoat 107P hardcoat (Steven)
- 2) Bring samples to receiving for batch number (Chris)
- 3) Sign off Conformity Inspection Record (Marcel)
- 4) Arrange burn test at Kmlx Aviation Inc. in Montreal. Forward Test Plan (attached) to Kmlx, let them know we're testing Test Article #5 only (3 coupons + 1 spare). Test to be witnessed by Dart Aerospace Authorized Person Chris Provencal. Date as soon as possible (next week?), preferably at 11:30AM. (Steven)
- 5) Package samples (Chris)
- 6) Fedex samples Kmlx. They need the samples a full 24hrs before the test date. (Steven)
- 7) Attend burn testing @ Kmlx (Chris)

Sincerely,

- **Chris Provencal, P.Eng**  
Senior Engineer



DART AEROSPACE LTD.  
1270 Aberdeen Street  
Hawkesbury, ON, K6A 1K7  
CANADA

Tel: 1 613 632 5200  
Fax: 1 613 632 5246

e-mail: [heli@dartaero.com](mailto:heli@dartaero.com)  
<http://www.dartaero.com>

## TEST PLAN

# *Flammability Testing*

TP-D139-1019-2

# *Replacement Window Kits*

AGUSTA AB/AW139 MODELS

Prepared By:

A handwritten signature in black ink, appearing to read "V. Seib".

V. Seib

Mechanical Designer

Checked By:

A handwritten signature in black ink, appearing to read "D. Shepherd".

D. Shepherd, P. Eng.  
Chief Engineer

Released By:

A handwritten signature in black ink, appearing to read "D. Shepherd".

D. Shepherd, P. Eng.  
Chief Engineer

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Revision: C

Date: 19.01.28

## REVISION RECORD

| Revision | Date     | Description                                         |
|----------|----------|-----------------------------------------------------|
| A        | 16.05.30 | New Issue                                           |
| B        | 18.04.04 | Add new materials proposed by Llamas Plastics, Inc. |
| C        | 19.01.28 | Add new materials proposed by Llamas Plastics, Inc. |

## 1.0 INTRODUCTION

DART Aerospace Ltd. (DART) is applying for a new Supplemental Type Certificate (STC) for the installation of D139-1019-XXX Skylight Window Replacement Kits.

The D139-1019-XXX Skylight Window Replacement Kits replace the OEM Roof Window Installation P/N 3G5610A00212 (3G5610A00733 LH; 3G5610A00633 RH), as shown in Figure 1.

The D139-1019-XXX Skylight Window Replacement Kits will be manufactured per Master Document List MDL-D139-1019, installed per Installation Instructions IIN-D139-1019, and maintained per Instructions for Continued Airworthiness ICA-D139-1019.

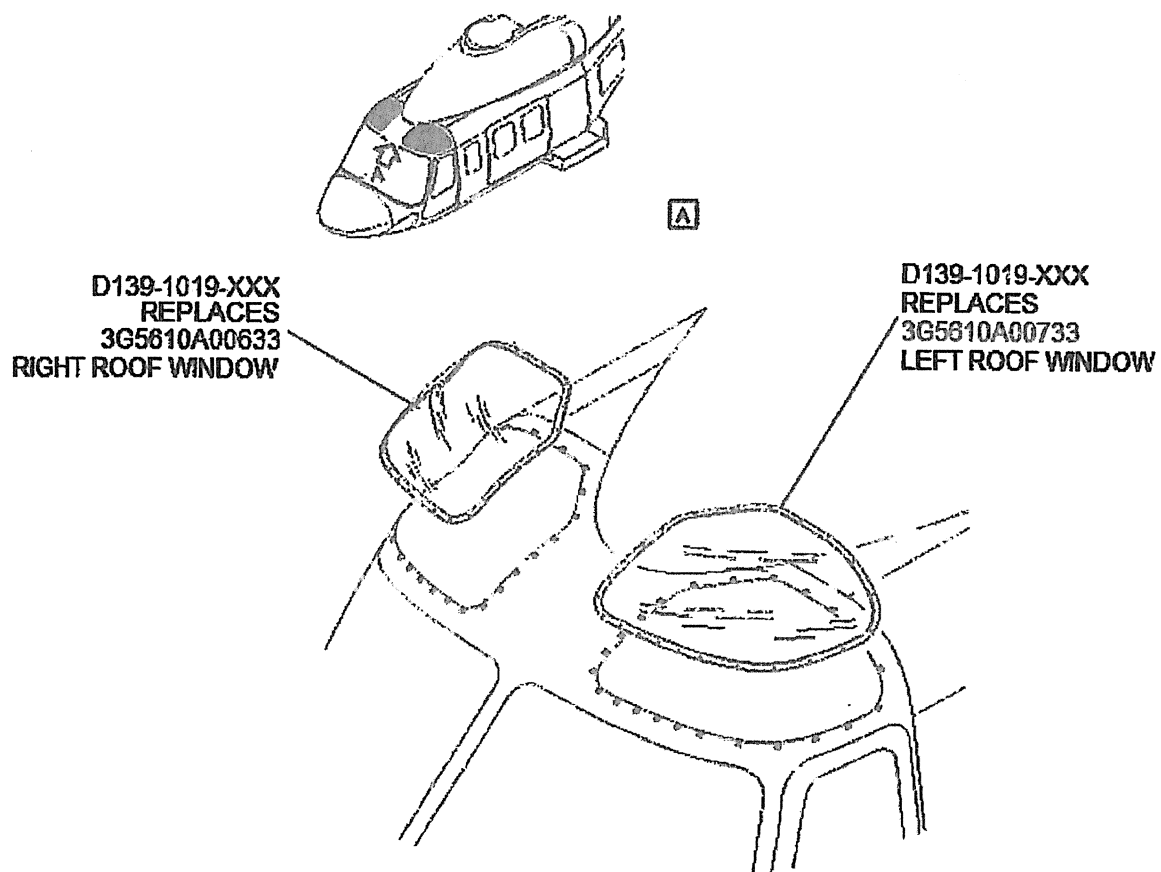


Figure 1 – D139-1019-XXX SKYLIGHT WINDOW REPLACEMENT KITS

## 2.0 PURPOSE

The purpose of this test plan, TP-D139-1019-2, is to outline the flammability testing to be conducted by Dart on the material used to manufacture the D139-1019-XXX Skylight Window Replacement Kits to show compliance to AWM 529/FAR 29/CS 29.853(a3) per Compliance Report ACR-D139-1019-1.

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Revision: C  
Date: 19.01.28

### 3.0 TEST METHODOLOGY

The testing will be conducted in accordance with the horizontal burn test procedure outlined in Part 1(b)(5) of FAR 25 Appendix F at Amendment 25-111 by KMLEX in Montreal, Quebec. The test setup and apparatus will be in accordance with Chapter 3 of the FAA Aircraft Materials Fire Test Handbook. In particular:

- a) Specimens will be conditioned to 70  $\pm$  5 °F and at 50%  $\pm$  5% relative humidity for 24 hours.
- b) Specimens will remain in the conditioning environment until subjected to the flame.
- c) The test will be conducted in draft free cabinet.
- d) The burner fuel will be methane gas with a minimum flame temperature of 1550°F measured by a calibrated thermocouple pyrometer in the center of the flame.
- e) The specimens will be exposed to the Bunsen burner with a nominal 3/8" ID tube adjusted to give a flame of 1.5" in height.
- f) The top of the burner is 0.75" from the bottom of the specimen.
- g) The flame will be applied for 15 seconds.
- h) Exposed area of the horizontal specimens is at least 2" x 12".

### 4.0 TEST SPECIMENS

The D5419-XXX and D5621-XXX Skylight Windows used in the D139-1019-XXX Skylight Window Replacement Kits will be manufactured from 0.177" thick polycarbonate and will retain a minimum thickness greater than 0.125" after forming. Per FAR 25 Appendix F Part (b)(2), specimens may be no greater than 0.125" thick. Therefore, the following samples (3 coupons and 1 spare) will be tested per Section 3.0 of this test plan:

| Test article | Description                                                                                                            | Sample       |
|--------------|------------------------------------------------------------------------------------------------------------------------|--------------|
| 1            | Polycarbonate Lexan FMR604 0.118" thick                                                                                | 4 @ 4" x 14" |
| 2            | Polycarbonate Makrolon FC 0.118" thick                                                                                 | 4 @ 4" x 14" |
| 3            | Polycarbonate, FG, Bronze # 5109, 0.187" thick cut to <0.125" thick, coated both sides with LPI Aerocoat 107P Hardcoat | 4 @ 4" x 14" |
| 4            | Clear UC Makrolon 0.177" thick cut to <0.125" thick, coated both sides with LPI Aerocoat 107P hardcoat                 | 4 @ 4" x 14" |
| 5            | Clear Tuffak GP 0.177" thick cut to <0.125" thick, coated both sides with LPI Aerocoat 107P hardcoat                   | 4 @ 4" x 14" |

### 5.0 CONFORMITY INSPECTION

An ANB043 Conformity Inspection Record will be completed by Marcel Daviau, or his delegate, confirming that all samples used for testing are made from the materials specified in Section 4.0.

### 6.0 TEST REPORT

Test Report TR-D139-1019-2 will be prepared to summarize the results of this test program. This report will include the aforementioned ANB043 Conformity Inspection Record and the test reports from KMLEX.

### 7.0 ACCEPTANCE CRITERIA

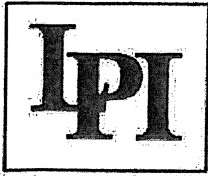
This test will be deemed to be successful if the materials used to manufacture the D139-1019-XXX Skylight Window Replacement Kits demonstrate a horizontal burn rate of less than 2.5 inches per minute.

## 8.0 CONCLUSION

It must be concluded that if the test is conducted in accordance with this Test Plan, TP-D139-1019-2, and the results of the test meet the acceptance criteria stated above, the materials used to manufacture the D139-1019-XXX Skylight Window Replacement Kits have met the requirements of AWM 529/FAR 29/CS 29.853(a3).

## 9.0 WITNESS

This test will be witnessed by Dart DE #03 Chris Provencal on behalf of Transport Canada.



## LLAMAS PLASTICS INC.

12970 BRADLEY AVE.  
SYLMAR, CA 91342  
(818) 362-0371  
Fax (818) 362-9780

DATE: 1/16/19

### CERTIFICATION OF COMPLIANCE

TO: **Dart Aerospace**

RE: Contract/Purchase Order No (s): **PO039083**

Part No(s): **Coupons (4"x14")**

Specification: **CLEAR TUFFAK GP 0.177" THICK CUT TO <0.125" THICK AND  
COATED BOTH SIDES WITH LPI AEROCOAT 107P HARDCOAT**

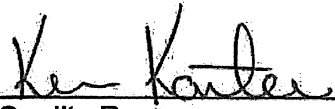
Description: **CLEAR-A00**

Lot/Batch # (when applicable): **N/A**

This is to certify that the material and/or processes used to fabricate the above part number, comply with the specifications, drawings and other requirements of the contract or purchase order indicated.

The required reports and other certificates covering all material in the parts listed above, are on file and available for examination upon request.

Llamas Plastics, Inc.

  
\_\_\_\_\_  
Quality Rep.



## PLASKOLITE, LLC.

119 Salisbury Road  
Sheffield, MA 01257

### *Certificate of Compliance*

**Customer P.O. #: AA35055**  
**Plaskolite Order #: 1158020**  
**Shipment #: 1715355**

Plaskolite's Quality Management system is certified to ISO 9001-2015.

TUFFAK® polycarbonate sheet has been tested in accordance with various ASTM methods. Typical properties and values can be found on the product data sheets.

With consideration given to the specific gauge and product, TUFFAK® polycarbonate sheet may be further characterized by the following certifications, specifications and agency listings as appropriate:

- International Code Council Evaluation Service ICC-ES-2728
- Underwriters Laboratories File #E351891
- Miami-Dade County, Florida Product Control NOA
- EN 10204-2.1
- ASTM-D-3935
- A-A-59502

| Item #   | Product Type              | Pallet/Reel #s                                                                                |
|----------|---------------------------|-----------------------------------------------------------------------------------------------|
| 58103202 | PCGP A00 .177 96.00 48.00 | 5229234  |

**Note:** Shipment has not been lot tested to the above but historical test results indicated that the type of product produced for this order conforms to the appropriate specifications and listings noted above.

Created by,  
Inside Sales



Dart Aerospace Ltd.  
1270 Aberdeen St  
Hawkesbury, ON  
K6A 1K7  
Canada

Tel (613) 632-5200

# PURCHASE ORDER

## PO039083



**Supplier:** LLA001-VU  
Llamas Plastics Inc.  
12970 Bradley Ave.  
Sylmar, CA 91342 USA  
Phone: 818-362-0371  
Fax: 818-362-9780

**Ship To:** 1270 Aberdeen Street  
Hawkesbury  
ON  
K6A 1K7 Canada  
Phone: 613-632-5200

**PO No:** PO039083

**PO Date:** 2/21/18

**Due Date:** 7/31/18

**Purchase Order  
Revision:**

**Revision Date:**

**Ship-To Contact:** Hemmerich, Steven  
Phone: 613-632-5200 Ext: 281  
shemmerich@dartaero.com

**Pymt Terms:** Net 30

**Freight Terms:**

**Special Comments:**

### Items

| Line Item                                                | Job    | Part       | Supplier Part No | Item No | Description                                                                                          | Status   | Account | Due Date | Order Quantity | Received Quantity | Balance | Unit Price (USD) | Extended Price |
|----------------------------------------------------------|--------|------------|------------------|---------|------------------------------------------------------------------------------------------------------|----------|---------|----------|----------------|-------------------|---------|------------------|----------------|
| 1                                                        | 180718 | D5621-041P |                  |         | Skylight Window Assembly, LH Clear. Prototype to be used for Testing & Qualifications                | Received | -       | 7/31/18  | 1 Ea           | 1 Ea              | 0 Ea    | \$2,246.00/Ea    | \$0.00         |
| <b>Line Item Note</b> As per PPEF Critical Design Review |        |            |                  |         |                                                                                                      |          |         |          |                |                   |         |                  |                |
| 2                                                        | 180719 | D5621-042P |                  |         | Skylight Window Assembly, RH Clear. Prototype for Testing & Qualification                            | Received | -       | 7/31/18  | 1 Ea           | 1 Ea              | 0 Ea    | \$2,246.00/Ea    | \$0.00         |
| <b>Line Item Note</b> As per PPEF Critical Design Review |        |            |                  |         |                                                                                                      |          |         |          |                |                   |         |                  |                |
| 3                                                        | 183021 | D5621-043P |                  |         | Skylight Window Assembly, LH Tinted. To be produced only after successful acceptance of proto-types. | Received | -       | 7/31/18  | 1 Ea           | 1 Ea              | 0 Ea    | \$2,246.00/Ea    | \$0.00         |
| <b>Line Item Note</b> As per PPEF Critical Design Review |        |            |                  |         |                                                                                                      |          |         |          |                |                   |         |                  |                |
| 4                                                        | 183022 | D5621-044P |                  |         | Skylight Window Assembly, RH Tinted. To be produced only after successful acceptance of proto-types. | Received | -       | 7/31/18  | 1 Ea           | 1 Ea              | 0 Ea    | \$2,246.00/Ea    | \$0.00         |
| <b>Line Item Note</b> As per PPEF Critical Design Review |        |            |                  |         |                                                                                                      |          |         |          |                |                   |         |                  |                |
| 5                                                        | 183023 | D5674-1P   |                  |         | Drill Bit<br>For tracking purposes only. Drill bits are included with window purchase                | Received | -       | 7/31/18  | 2 pcs          | 2 pcs             | 0 pcs   | \$0.01/pcs       | \$0.00         |
| 6                                                        |        | MISC       |                  |         | MISCELLANEOUS<br>Burn test required.                                                                 | Firmed   | -       | 7/31/18  | 4 pcs          | 0 pcs             | 4 pcs   | \$0.00/pcs       | \$0.00         |
|                                                          |        |            |                  |         | Shipped to                                                                                           |          |         |          |                |                   |         |                  |                |
|                                                          |        |            |                  |         | Under PO                                                                                             |          |         |          |                |                   |         |                  |                |



Dart Aerospace Ltd.  
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Hawkesbury, ON  
K6A 1K7  
Canada

Tel (613) 632-5200

# PURCHASE ORDER

## PO039083



### Items

| Line Item    | Job | Part | Supplier Part No | Item No | Description                                                                                                                | Status | Account | Due Date | Order Quantity | Received Quantity | Balance | Unit Price (USD) | Extended Price |
|--------------|-----|------|------------------|---------|----------------------------------------------------------------------------------------------------------------------------|--------|---------|----------|----------------|-------------------|---------|------------------|----------------|
| 7            |     | MISC |                  |         | MISCELLANEOUS<br>Burn test required. New material<br>Clear Tuffak GP 0.177. Clear<br>A00<br><br>Shipped to<br><br>Under PO | Firmed | -       | 7/31/18  | 4 pcs          | 0 pcs             | 4 pcs   | \$0.00/pcs       | \$0.00         |
| Grand Total: |     |      |                  |         |                                                                                                                            |        |         |          |                |                   |         |                  | \$0.00         |

### Order Notes

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit [www.dartaerospace.com](http://www.dartaerospace.com) for further explanation.

Plex 2/4/19 3:05 PM dart.hemmerich.steven

## CONFORMITY INSPECTION RECORD

|                                                |                                          |                                                                           |                          |                       |
|------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------|--------------------------|-----------------------|
| <b>Applicant:</b><br>Dart Aerospace Ltd.       |                                          | <b>Title of Change:</b><br>Flammability Testing per TP-D139-1019-2 Rev. C |                          |                       |
| <b>Aeronautical Product:</b><br>Helicopter     | <b>Make:</b><br>Leonardo                 | <b>Model:</b><br>AW139                                                    | <b>Serial No.</b><br>ALL | <b>Region:</b><br>PNR |
| <b>Applicant's Inspector:</b><br>Marcel Daviau | <b>Date of Inspection:</b><br>2019.01.28 | <b>Applicant's Project Manager:</b><br>Victoria Seib                      |                          |                       |

| Item Inspected                                                                                                                                | Controlling Document  | Finding |        | Additional Findings                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------|--------|---------------------------------------------------|
|                                                                                                                                               |                       | Sat.    | Unsat. |                                                   |
| Qty(4) x 4" wide x 14" long x 0.177" thick cut to <0.125" thick samples of Clear Tuffak GP, coated both sides with LPI Aerocoat 107P hardcoat | TP-D139-1019-2 Rev. C | S       |        | S/N: S150637<br>PO: 0039083<br>OEM batch: 5229234 |
|                                                                                                                                               |                       |         |        |                                                   |
|                                                                                                                                               |                       |         |        |                                                   |
|                                                                                                                                               |                       |         |        |                                                   |
|                                                                                                                                               |                       |         |        |                                                   |
|                                                                                                                                               |                       |         |        |                                                   |
|                                                                                                                                               |                       |         |        |                                                   |

### APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation and/or test setup is in conformity with the items listed above.

Signature:  Date: Feb 6th, 2019

### TC INSPECTION

- ☐ ACCEPTABLE  
☐ UNACCEPTABLE

Additional Remarks:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_